CLAIMS:

1. A process comprising:

(a) solution depositing a composition comprising a liquid and a plurality of metal nanoparticles with a stabilizer on a substrate to result in a deposited composition; and

(b) heating the deposited composition to cause the metal nanoparticles to form an electrically conductive layer of an electronic device, wherein one or more of the liquid, the stabilizer, and a decomposed stabilizer is optionally part of the electrically conductive layer but if present is in a residual amount.

2. The process of claim 1, wherein the stabilizer is chemically bonded to the metal nanoparticles.

3. The process of claim 1, wherein the stabilizer is physically attached to the metal nanoparticles.

4. The process of claim 1, wherein the heating causes the metal nanoparticles to coalesce to form the electrically conductive layer.

5. The process of claim 1, wherein the heating causes the metal nanoparticles to achieve particle-to-particle contact to form the electrically conductive layer.

6. The process of claim 1, wherein the metal nanoparticles consist of a single metal.

7. The process of claim 6, wherein the single metal is Al, Au, Ag, Pt, Pd, Cu, Co, In or Ni.

8. The process of claim 1, wherein the metal nanoparticles are a metal composite.

9. The process of claim 8, wherein the metal composite is Au-Ag, Au-Cu, Ag-Cu, Au-Ag-Cu, or Au-Ag-Pd.

10. The process of claim 1, wherein the metal particles are a single metal or a metal composite selected from transition metals.

11. The process of claim 1, wherein the solution depositing is accomplished by solution printing.

12. The process of claim 1, wherein the solution depositing is accomplished by solution coating.

13. The process of claim 1, wherein the metal nanoparticles have an average particle size of less than about 100 nm.

14. The process of claim 1, wherein the stabilizer is an organic stabilizer.

15. The process of claim 1, wherein the stabilizer is a thiol or an amine.

16. The process of claim 1, wherein the stabilizer is selected from the group consisting of a thiol, a dithiol, an amine, a diamine, a carboxylic acid, a carboxylate, a polyethylene glycol, a pyridine derivative, an organophosphine, and a mixture thereof.

17. The process of claim 1, wherein the substrate is flexible.

18. The process of claim 1, wherein the substrate is plastic.

19. The process of claim 1, wherein the heating temperature is from about 50 to about 250 degrees C.

20. The process of claim 1, wherein the heating temperature is from about 50 to about 150 degrees C.

21. The process of claim 1, wherein the electrically conductive layer has a conductivity of more than about 0.1 S/cm.

22. The process of claim 1, wherein the electrically conductive layer has a conductivity of more than about 100 S/cm.

23. The process of claim 1, wherein the electrically conductive layer has a conductivity of more than about 500 S/cm.

24. The process of claim 1, wherein the metal nanoparticles consists of a single metal of gold and the stabilizer is a thiol.

25. A process comprising:

(a) solution printing a composition comprising a liquid and a plurality of coinage metal containing nanoparticles with a stabilizer on a plastic substrate to result in a deposited composition; and

(b) heating the deposited composition to cause the coinage metal containing nanoparticles to coalesce to form an electrically conductive layer of an electronic device, wherein one or more of the liquid, the stabilizer, and a decomposed stabilizer is optionally part of the electrically conductive layer but if present is in a residual amount.

26. An apparatus comprising:

(a) a substrate

(b) a deposited composition comprising a liquid and a plurality of metal nanoparticles with a covalently bonded stabilizer.

27. An electronic device comprising:

(a) a substrate

(b) an electrically conductive layer comprising coalesced metal nanoparticles and a residual amount of one or both of a stabilizer and a decomposed stabilizer as part of the electrically conductive layer.

28. A thin film transistor comprising:

(a) an insulating layer;

(b) a gate electrode;

(c) a semiconductor layer;

(d) a source electrode; and

(e) a drain electrode,

wherein the insulating layer, the gate electrode, the semiconductor layer, the source electrode, and the drain electrode are in any sequence as long as the gate electrode and the semiconductor layer both contact the insulating layer, and the source electrode and the drain electrode both contact the semiconductor layer, and

wherein at least one of the source electrode, the drain electrode, and the gate electrode comprise coalesced coinage metal containing nanoparticles and a residual amount of one or both of a stabilizer and a decomposed stabilizer.

29. The thin film transistor of claim 28 having an on/off ratio greater than about 10^2.